



To: James Cashwell
From: Chris Ricardi
Date: November 2, 2012
Subject: 51 Eames Street Property Slurry Wall Quarterly Monitoring Program 3Q12 – August 2012

**DATA VALIDATION REPORT
AUGUST 2012 SLURRY WALL GROUNDWATER AND SURFACE WATER
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS**

TestAmerica Laboratories Data Sets: 360-42351-1 and 360-42352-1

1.0 INTRODUCTION

Groundwater and surface water samples were collected from the Olin Chemical Superfund Site from August 20 through 23, 2012. Samples were analyzed by TestAmerica Laboratories Inc. in Westfield, Massachusetts. Data were reported in sample delivery groups (SDGs) 360-42351-1 and 360-42352-1. A summary of samples included in this review is contained in Table 1. Samples reviewed in this report were analyzed for the following USEPA SW-846 (USEPA, 1996), USEPA wastewater (USEPA, 1993), or Standard Methods (APHA, 1995):

- Dissolved Metals (aluminum and chromium) by USEPA Method 6010B in groundwater
- Dissolved and Total Metals (aluminum, chromium, and sodium) by USEPA Method 6010B in surface water
- General chemistry analyses for ammonia by USEPA Method 350.1 (Lachat 10-107-06-1B), chloride, nitrate, nitrite, and sulfate by USEPA Method 300.0, and specific conductance by SM 2510B

The Final Interim Response Steps Work Plan (MACTEC, 2007) and the MassDEP Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP) [MassDEP, 2010] were used as references during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington monitoring tasks. Final sample results are presented on data summaries in Table 2. A summary of validation qualification actions is presented on Table 3. Validation reason codes are associated with final results that have been qualified as indicated in Table 3.

2.0 METALS

Data were reviewed for the following parameters:

- * Data Completeness
- * Holding Time

- * Blanks
 - * Laboratory Control Sample / Laboratory Control Sample Duplicate Analysis (LCS/LCSD)
 - * Matrix Spike / Matrix Spike Duplicate Analysis (surface water only)
 - * Detection Limits
Dissolved vs. Total Metals Comparison (surface water only)
- * indicates that criteria were met for this parameter

Dissolved vs. Total Metals Comparison

SDG 360-42351-1

The concentration of sodium in the dissolved fraction of sample OC-SW-ISCO3 is over ten percent greater than the concentration reported in the total fraction (20%). This limit applies where the sample results are greater than five times the reporting limit. The results in these samples were qualified estimated (J).

3.0 GENERAL CHEMISTRY – Ammonia, Chloride, Sulfate, Nitrate, Nitrite, and Specific Conductance

Data were reviewed for the following parameters:

- * Data Completeness
 - * Holding Time
 - * Blanks
 - * Matrix Spike Analysis (sulfate and chloride in groundwater only)
 - * Laboratory Duplicate Analysis (specific conductance only)
 - * Laboratory Control Sample / Laboratory Control Sample Duplicate Analysis
 - * Detection Limits
- * indicates that criteria were met for this parameter

Detection Limits

Nitrite quantitation limits were reported above the project goal of 0.01 mg/L due to dilution in the following samples:

SDG 360-42352-1

SDG	Lab Sample ID	Field Sample ID	Parameter	Final Result (mg/l)	Final Qual	Dilution Factor
360-42352-1	360-42352-1	OC-SW-ISCO3	Nitrite as N	0.10	U	10
360-42352-1	360-42352-2	OC-SW-ISCO2	Nitrite as N	0.10	U	10
360-42352-1	360-42352-3	OC-SW-PZ-16RRSW	Nitrite as N	0.10	U	10
360-42352-1	360-42352-4	OC-SW-PZ-17RRSW	Nitrite as N	0.10	U	10

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Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Field Sample ID	Parameter	Final Result (mg/l)	Final Qual	Dilution Factor
360-42352-1	360-42352-5	OC-SW-SD-17	Nitrite as N	0.10	U	10
360-42352-1	360-42352-6	OC-SW-PZ-18RSW	Nitrite as N	0.10	U	10
360-42352-1	360-42352-7	OC-SW-ISCO1	Nitrite as N	0.10	U	10

Unless discussed above, sample results are interpreted to be usable as reported by TestAmerica.



11/02/12

Chris Ricardi, NRCC-EAC
Senior Chemist

Date



Michael Murphy
Project Principal


Date

References:

American Public Health Association (APHA), 1995. "Standard Methods for Examination of Water and Wastewater"; 19th Edition; APHA, 1015 Fifteenth St., NW. Washington, DC 20005.

MACTEC, 2007. "Final Interim Response Steps Work Plan"; Olin Chemical Superfund Site; 51 Eames Street, Wilmington, Massachusetts; August 8, 2007.

Massachusetts Department of Environmental Protection (MassDEP), 2010. "The Compendium of Quality Assurance and Quality Control Requirements and Performance Standards for Selected Analytical Methods Used in Support of Response Actions for the Massachusetts Contingency Plan (MCP)"; Bureau of Waste Site Cleanup; 1 Winter Street, Boston, Massachusetts 02108; WSC-CAM; July 2010.

U.S. Environmental Protection Agency (USEPA), 1993. "Methods for Chemical Analysis and Water and Wastes (MCAWW)", EPA/600/4-79-020 (March 1983) with updates and supplements EPA/600/4-91-010 (June 1991), EPA/600/R-92-129 (August 1992) and EPA/600/R-93-100 (August 1993).

U.S. Environmental Protection Agency (USEPA), 1996. "Test Methods for Evaluating Solid Waste"; Laboratory Manual Physical/Chemical Methods; Office of Solid Waste and Emergency Response; Washington, DC; SW-846; November 1986; Revision 4 - December 1996.

Table 1
Sample Summary
Data Validation Report
August 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				SW846 6010B	SW846 6010B	E350.1 (QuickChem 10-107-06-1-B)	A2510B	40CFR136A 300.0
Lab Sample ID	Location	Sample ID	Sample Date	Total Metals	Filtered Metals	Ammonia	Conductance	Anions
Groundwater								
360-42351-1	PZ-25	OC-PZ-25	8/20/2012		2	1	1	2
360-42351-2	GW-202S	OC-GW-202S	8/20/2012		2	1	1	2
360-42351-3	GW-202D	OC-GW-202D	8/20/2012		2	1	1	2
360-42351-4	GW-25	OC-GW-25	8/21/2012		2	1	1	2
360-42351-5	PZ-18R	OC-PZ-18R	8/21/2012		2	1	1	2
360-42351-6	PZ-24	OC-PZ-24	8/21/2012		2	1	1	2
360-42351-7	PZ-17RR	OC-PZ-17RR	8/21/2012		2	1	1	2
360-42351-8	GW-78S	OC-GW-78S	8/22/2012		2	1	1	2
360-42351-9	GW-79S	OC-GW-79S	8/22/2012		2	1	1	2
360-42351-10	PZ-16RR	OC-PZ-16RR	8/22/2012		2	1	1	2
Surface Water								
360-42352-1	ISCO3	OC-SW-ISCO3	8/23/2012	3	3	1	1	4
360-42352-2	ISCO2	OC-SW-ISCO2	8/23/2012	3	3	1	1	4
360-42352-3	PZ-16RR	OC-SW-PZ-16RRSW	8/23/2012	3	3	1	1	4
360-42352-4	PZ-17RR	OC-SW-PZ-17RRSW	8/23/2012	3	3	1	1	4
360-42352-5	SD-17	OC-SW-SD-17	8/23/2012	3	3	1	1	4
360-42352-6	PZ-18R	OC-SW-PZ-18RSW	8/23/2012	3	3	1	1	4
360-42352-7	ISCO1	OC-SW-ISCO1	8/23/2012	3	3	1	1	4

Notes:

Number listed under method indicates number of target analytes reported.

Prepared by / Date: KJC 09/21/12

Checked by / Date: TLC 09/25/12

Table 2
Final Results Summary
Data Validation Report
August 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name		GW-202D		GW-202S		GW-25		GW-78S		GW-79S		PZ-16RR		PZ-17RR		PZ-18R	
				Field Sample ID		OC-GW-202D		OC-GW-202S		OC-GW-25		OC-GW-78S		OC-GW-79S		OC-PZ-16RR		OC-PZ-17RR		OC-PZ-18R	
				Field Sample Date		08/20/12		08/20/12		08/21/12		08/22/12		08/22/12		08/22/12		08/21/12		08/21/12	
				QC Code		FS		FS		FS		FS		FS		FS		FS		FS	
				Lab Sample Delivery Group		360-42351-1		360-42351-1		360-42351-1		360-42351-1		360-42351-1		360-42351-1		360-42351-1		360-42351-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
F	SW6010	Aluminum	ug/l	8800		13	J	100	U	100	U	74	J	100	U	40	J	14	J		
F	SW6010	Chromium	ug/l	790		4	J	1.6	J	2.1	J	26		2.9	J	10		11			
N	E300_cl	Chloride	mg/l	250		51		120		22		230		160		150		84			
N	E300_slf	Sulfate	mg/l	1500		270		72		480		980		500		230		14			
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	240		55		42		52		150		130		28		35			
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	3600		980		750		1300		2800		1800		1300		630			

Notes:

N = normal

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Table 2
Final Results Summary
Data Validation Report
August 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

				Loc Name	PZ-24		PZ-25	
				Field Sample ID	OC-PZ-24		OC-PZ-25	
				Field Sample Date	08/21/12		08/20/12	
				QC Code	FS		FS	
				Lab Sample Delivery Group	360-42351-1		360-42351-1	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	
F	SW6010	Aluminum	ug/l	17	J	100	U	
F	SW6010	Chromium	ug/l	18		7.6		
N	E300_cl	Chloride	mg/l	17		20		
N	E300_slf	Sulfate	mg/l	700		460		
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	60		48		
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	1800		1300		

Notes:

N = normal

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Prepared by / Date: KJC 09/27/12

Checked by / Date: TLC 10/30/12

Table 2
Final Results Summary
Data Validation Report
August 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
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				ISCO1		ISCO2		ISCO3		PZ-16RR		PZ-17RR		PZ-18R		SD-17	
Loc Name				OC-SW-ISCO1		OC-SW-ISCO2		OC-SW-ISCO3		OC-SW-PZ-16RRSW		OC-SW-PZ-17RRSW		OC-SW-PZ-18RSW		OC-SW-SD-17	
Field Sample ID				08/23/12		08/23/12		08/23/12		08/23/12		08/23/12		08/23/12		08/23/12	
Field Sample Date				FS		FS		FS		FS		FS		FS		FS	
QC Code				360-42352-1		360-42352-1		360-42352-1		360-42352-1		360-42352-1		360-42352-1		360-42352-1	
Lab Sample Delivery Group																	
Frac	Method	Analyte	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
T	SW6010	Aluminum	ug/l	80	J	160		540		990		7,600		93	J	11,000	
T	SW6010	Chromium	ug/l	13		30		3.5	J	370		1,800		13		2,400	
T	SW6010	Sodium	ug/l	69,000		190,000		74,000	J	210,000		240,000		64,000		190,000	
F	SW6010	Aluminum	ug/l	43	J	58	J	23	J	140		1,900		64	J	1,000	
F	SW6010	Chromium	ug/l	9.6		13		0.68	J	170		830		11		520	
F	SW6010	Sodium	ug/l	69,000		200,000		89,000	J	220,000		240,000		64,000		200,000	
N	E300_cl	Chloride	mg/l	120		210		180		230		250		100		210	
N	A2510B	LAB SPECIFIC CONDUCTANCE	umhos/cm	680		2,100		720		2,400		2,400		630		2,000	
N	E300_no2	Nitrate as N	mg/l	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
N	E300_no3	Nitrite as N	mg/l	0.12		2.1		0.72		0.7		0.36		0.14		0.6	
N	LACH_107_06_1_B	Nitrogen, as Ammonia	mg/l	29		110		1.7		140		130		27		110	
N	E300_slf	Sulfate	mg/l	120		690		26		830		850		97		670	

Notes:

N = normal

T = total (unfiltered)

F = filtered

FS = field sample

U = not detected, value is the detection limit

J = value is estimated

ug/l = microgram per liter

mg/l = milligram per liter

umhos/cm = micromhos per centimeter

Prepared by / Date: KJC 09/27/12

Checked by / Date: TLC 10/30/12

Table 3
Validation Qualification Action Summary
Data Validation Report
August 2012 Slurry Wall / Cap Groundwater and Surface Water
Olin Chemical Superfund Site
Wilmington, Massachusetts

SDG	Lab Sample ID	Analytical Method	Fraction	Field Sample ID	Parameter	Lab Result	Lab Qualifier	Final Result	Final Qualifier	Val Reason Code	Units
360-42352-1	360-42352-1	SW6010	F	OC-SW-ISCO3	Sodium	89000		89000	J	TD	ug/l
360-42352-1	360-42352-1	SW6010	T	OC-SW-ISCO3	Sodium	74000		74000	J	TD	ug/l

Units:

ug/l = microgram per liter

Validation Qualifier:

J = Value is estimated

Prepared by / Date: KJC 09/27/12

Checked by / Date: TLC 10/30/12

Fraction

T = Total

F = Filtered

Validation Reason Codes:

TD = Dissolved concentration exceeds total concentration by greater than ten percent

Data Validation Checklists

And

Data Validation Summaries

OLIN-WILMINGTON
LEVEL I DATA QUALITY EVALUATION
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

Reviewer/Date Tige Cunningham 9/26/12
Sr. Review/Date Chrs Ricardi 11/2/12
Lab Report # 360-42351-1 and 42352-1
Project # 6107120016-10

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☐ No ☒ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☐ Narrative includes an explanation of each discrepancy on the

Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of completed COC.

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STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

1.5 Sample Receipt Information (Cooler Receipt Form present?):

Yes ☒ No ☐ N/A ☐ Comments:

Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

- ☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).
- ☒ Container type noted ☒ sample condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.2 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

1.6 Sample Results Section: Was each of the following requirements supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- | | | | | | |
|---|--|--|--|--|--|
| <input checked="" type="checkbox"/> Field ID and Lab ID | <input checked="" type="checkbox"/> Date and time collected | <input checked="" type="checkbox"/> Analyst Initials | <input checked="" type="checkbox"/> Dilution Factor | <input type="checkbox"/> % moisture or solids <i>N/A</i> | <input checked="" type="checkbox"/> Reporting limits |
| <input type="checkbox"/> Clean-up method <i>N/A</i> | <input checked="" type="checkbox"/> Analysis method | <input checked="" type="checkbox"/> Preparation method | <input checked="" type="checkbox"/> Date of preparation/extraction/digestion clean-up and analysis, where applicable | | |
| <input checked="" type="checkbox"/> Matrix | <input checked="" type="checkbox"/> Target analytes and concentrations | <input checked="" type="checkbox"/> Units (soils must be reported in dry weight) | | | |

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was each of the following information supplied in the laboratory report for each sample batch?

Yes ☒ No ☐ N/A ☐ Comments:

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LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

☒ Method blank results ☒ LCS recoveries ☐ MS/MSD recoveries and RPDs ☐ Laboratory duplicate results (where applicable)

ACTION: If no, contact lab for submission of missing or incomplete information.

N/A

NO See LCSD

2.0 Holding Times

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? Holding time for metals is 180 days from sample collection to analysis for both water and soil. Yes ☐ No ☒ N/A ☐ Comments:

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded, qualify all positive results (J) and non-detects (UJ). If grossly exceeded (2X holding time) reject (R) all non-detect results.

3.0 Laboratory Method

3.1 Was the correct laboratory method used? Yes ☒ No ☐ N/A ☐ Comments:

Water Digestion	3005A or 3010A or 3020A
Soil Digestion	3050B
Metals	6010B or 200.7

ACTION: If no, contact laboratory to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change and to request variance.

3.2 Are the practical quantitation limits the same as those specified by the Yes ☒ No ☐ N/A ☐ Comments:
☒ SOW ☐ QAPP ☐ Lab ☐ MADEP

NOTE: Verify that the reported metals match the target list specified on the COC.

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STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

ACTION: If no, evaluate variation with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are results present for each sample in the SDG?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact the lab for submission.

4.0 Method Blanks

4.1 Is the Method Blank Summary present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call the laboratory for submission of missing data.

4.2 Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact laboratory for justification. Consult senior chemist for action needed. Narrate non-compliance.

4.3 Is the method blank less than the PQLs for all target elements?

Yes ☒ No ☐ N/A ☐ Comments:

NOTE: MADEP requires the method blank to be matrix matched and digested with the samples

4.4 Do any method blanks have positive results for metals? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

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STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = $5 \times$ the blank value) and the associated samples and qualifiers.

5.0 Laboratory Control Standard

5.1 Was a laboratory control standard run with each analytical batch of 20 samples or less? Yes ☒ No ☐ N/A ☐ Comments:

NOTE: A *full target, second source LCS* is required by MADEP.

ACTION: Call laboratory for LCS form submittal. If data are not available, use professional judgement to evaluate data accuracy associated with that batch.

5.2 Is a LCS Summary Form present? Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is the recovery of any analyte outside of MADEP control limits? Yes ☐ No ☒ N/A ☐ Comments:

<u>Sample Type</u>	<u>MADEP % Rec</u>
Water	80-120
Soil	within Lab generated limits

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and non-detects results within the batch as (J). If LCS recovery is $< 30\%$, positive and non-detect results are rejected (R).

Comments:

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LEVEL I DATA QUALITY EVALUATION – OPTION 1

STANDARD OPERATING PROCEDURE AND CHECKLIST

ICP METALS BY METHOD 6010B/200.7

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked. Yes ☐ No ☒ N/A ☐ Comments:

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present? Yes [] No [] N/A [✓] Comments:

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule? Yes ☐ No ☐ N/A ☒ Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits? Yes [] No [] N/A [✓] Comments:

Sample Type	<i>MADEP</i> % Rec	QAPP % Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE: %R = $\frac{(SSR-SR)}{SA} \times 100\%$

Where: SSR = Spiked sample result
SR = Sample result
SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

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LEVEL I DATA QUALITY EVALUATION – OPTION 1
STANDARD OPERATING PROCEDURE AND CHECKLIST
ICP METALS BY METHOD 6010B/200.7

<i>MADEP Laboratory Duplicate Sample RPD Criteria:</i>	<u>QAPP RPD</u>
<i>For aqueous results > 5×RL, RPD must be ± 20%</i>	20
<i>For aqueous results < 5×RL, RPD must be ≤ RL</i>	20
<i>For soil/sediment results > 5×RL, RPD must be ± 35%</i>	20
<i>For soil/sediment results < 5×RL, RPD must be ≤ 2×RL</i>	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐ No ☒ N/A ☐ Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐ No ☐ N/A ☒ Comments:

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is < 5 × blank value, flag sample result non-detect “U” at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☐ No ☒ N/A ☐ Comments:

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NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? Yes ☐ No ☐ N/A ☒ Comments:

NOTE: $RPD = \frac{S-D}{(S+D)/2} \times 100\%$ Where: S = MS sample result
D = MSD sample result

NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J).

7.0 **Laboratory Duplicate**

7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present? Yes ☐ No ☒ N/A ☐ Comments:

NOTE: MADEP refers to this sample as a "matrix duplicate".

ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.

7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits? Yes ☐ No ☐ N/A ☒ Comments:

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9.2 Were field duplicates collected per the required frequency?

Yes ☐

No ☐

N/A ☒

Comments:

SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 50\%$ for soils or waters? Calculate the RPD for all results and attach to this review.

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: RPD must be $\leq 50\%$ for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.

10.0 Special QA/QC

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.

Yes ☒

No ☐

N/A ☐

Comments:

ACTION: If results for both total and dissolved are $\geq 5x$ the PQL **and** the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL **and** the **difference** exceeds 2x the PQL, flag both results as estimated (J)

→ on the SW only

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10.0 Application of Validation Qualifiers

Was any of the data qualified?

Yes ☒ No ☐ N/A ☐ Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag** pages for entry in database.

Total vs. Dissolved

REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols," WSC-CAM #10-320, Final, Revision No. 1, 1 July 2010.
- MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Action Conducted Under the Massachusetts Contingency Plan (MCP)," WSC-CAM, Section VIIA, Final, Revision No. 1, 1 July 2010.
- MADEP, 2010. "Quality Control Requirements and Performance Standards for the Analysis of Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) in Support of Response Actions under the Massachusetts Contingency Plan (MCP)" WSC-CAM, Final, Revision No. 1, 5 July 2010.

Client Sample Results

Client: Olin Corporation
Project/Site: Olin Chemical Quarterly Surfacewater

TestAmerica Job ID: 360-42352-1

Client Sample ID: OC-SW-ISC03

Lab Sample ID: 360-42352-1

Date Collected: 08/23/12 09:50

Matrix: Water

Date Received: 08/23/12 17:00

Method: 6010C - Metals (ICP)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	540		100	13	ug/L		08/30/12 08:55	08/30/12 16:17	1
Chromium	3.5	J	5.0	0.53	ug/L		08/30/12 08:55	08/30/12 16:17	1
Sodium	74000	J	2000	700	ug/L		08/30/12 08:55	08/30/12 16:17	1
Method: 6010C - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	23	J	100	13	ug/L		08/30/12 08:55	08/30/12 15:56	1
Chromium	0.68	J	5.0	0.53	ug/L		08/30/12 08:55	08/30/12 15:56	1
Sodium	89000	J	2000	700	ug/L		08/30/12 08:55	08/30/12 15:56	1
General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.72		0.050	0.050	mg/L			08/24/12 16:52	1
Sulfate	26		2.0	2.0	mg/L			08/24/12 16:52	1
Chloride	180		10	10	mg/L			08/24/12 17:09	10
Nitrite as N	ND		0.10	0.10	mg/L			08/24/12 17:09	10
Ammonia	1.7		0.10	0.10	mg/L		09/04/12 12:49	09/05/12 12:36	1
Specific Conductance	720		1.0	1.0	umhos/cm			09/04/12 13:34	1

TC
9/25/12

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Reviewer/Date Tige Cunningham 9/26/12
 Sr. Review/Date Chris Riccardi 11/2/12
 Lab Report # 360-42351-1 and 560-42352-1
 Project # 6107120016-10

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for **Sampling, Data Evaluation and Reporting Activities.**" MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0 Laboratory Deliverable Requirements

1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes ☒ No ☐ N/A ☐ Comments:
 Check items received.

☒ Name of Laboratory ☒ Address ☒ Project ID ☒ Phone # ☒ Sample identification – Field and Laboratory
Client Information: ☒ Name ☒ Address ☒ Client Contact (IDs must be cross-referenced)

ACTION: If no, contact lab for submission of missing or illegible information.

1.2 Laboratory Report Certification Statement

Yes ☐ No ☒ N/A ☐ Comments:

Does the laboratory report include a completed Analytical Report Certification in the required format?

ACTION: If no, contact lab for submission of missing certification or certification with correct format.

1.3 Laboratory Case Narrative:

Yes ☒ No ☐ N/A ☐ Comments:

☒ Narrative serves as an exception report for the project and method QA/QC performance. ☒ Narrative includes an explanation of each discrepancy on the Certification Statement.

ACTION: If no, contact lab for submission of missing or illegible information.

1.4 Chain of Custody (COC) copy present with all documentation completed?

Yes ☒ No ☐ N/A ☐ Comments:

Does the laboratory report include copies of Chain of Custody forms containing all samples in this SDG?

NOTE: Olin receives and maintains the *original* COC.

ACTION: If no, contact lab for submission of copy of missing completed COC.

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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Yes ☒ No ☐ N/A ☐ Comments:

☒ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).

☒ Container type noted ☒ Condition observed ☒ pH verified (where applicable) ☒ Field and lab IDs cross referenced

ACTION: If no, contact lab for submission of missing or incomplete documentation.

1.5.1 Were the correct bottles and preservatives used?

Ammonia, – 1 Liter polyethylene/H₂SO₄ to pH<2, cool to 4°C ✓

Oil & Grease – 1 Liter glass/HCL or H₂SO₄ to pH<2, cool to 4°C

Alkalinity – 1 Liter polyethylene/cool to 4°C

Chemical Oxygen Demand – 50 mL polyethylene/H₂SO₄ to pH<2, cool to 4°C

Chloride, pH, sulfate, nitrate, nitrite - 50 mL polyethylene/cool to 4°C ✓

Nitrate/nitrite - H₂SO₄ to pH<2, cool to 4°C

Organic Carbon – 500 mL amber glass bottle/HCl or H₂SO₄ to pH<2, cool to 4°C

Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C

Phenolics - H₂SO₄ to pH<2, cool to 4°C

Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C ✓

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment

1.5.2 Were all samples delivered to the laboratory without breakage?

Yes ☒ No ☐ N/A ☐ Comments:

1.5.3 Does the *Cooler Receipt Form* or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?

Yes ☐ No ☒ N/A ☐ Comments:

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1.6 Sample Results Section: Was the following information supplied in the laboratory report for each sample?

Yes ☒ No ☐ N/A ☐ Comments:

- | | | | | | |
|---|--|--|--|--|--|
| <input checked="" type="checkbox"/> Field ID and Lab ID | <input checked="" type="checkbox"/> Date and time collected | <input checked="" type="checkbox"/> Analyst Initials | <input checked="" type="checkbox"/> Dilution Factor | <input type="checkbox"/> % moisture or solids <i>N/A</i> | <input checked="" type="checkbox"/> Reporting limits |
| <input type="checkbox"/> Clean-up method <i>N/A</i> | <input checked="" type="checkbox"/> Analysis method | <input checked="" type="checkbox"/> Preparation method | <input checked="" type="checkbox"/> Date of preparation/extraction/digestion clean-up and analysis, where applicable | | |
| <input checked="" type="checkbox"/> Matrix | <input checked="" type="checkbox"/> Target analytes and concentrations | | <input checked="" type="checkbox"/> Units (soils must be reported in dry weight) | | |

ACTION: If no, contact lab for submission of missing or incomplete information.

1.7 QA/QC Information: Was the following information provided in the laboratory report for each sample batch? Yes ☐ No ☐ N/A ☐ Comments:

- | | | | |
|--|--|--|--|
| <input checked="" type="checkbox"/> Method blank results | <input checked="" type="checkbox"/> LCS recoveries | <input checked="" type="checkbox"/> MS/MSD recoveries and RPDs <i>sulfate/chloride</i> | <input checked="" type="checkbox"/> Laboratory duplicate results (where applicable) <i>specific conductivity</i> |
|--|--|--|--|

ACTION: If no, contact lab for submission of missing or incomplete information.

2.0 Holding Times

Yes ☐ No ☒ N/A ☐ Comments:

Have any technical holding times, determined from date of collection to date of analysis, been exceeded? The holding times are as follows:

28 days = ammonia, chemical oxygen demand, chloride, organic carbon, oil & grease, specific conductance, total organic carbon and sulfate

Alkalinity = 14 days

Sulfide, TDS, TSS = 7 days

pH = analyze immediately

Nitrate nitrogen as N = 48 hrs

Nitrite nitrogen as N = 48 hrs

Nitrate + Nitrite as N = 28 days

NOTE: List samples that exceed hold time with # of days exceeded on checklist

ACTION: If technical holding times are exceeded qualify results (J). For water samples that are grossly exceeded (>2X hold time) reject (R) all non-detect results. Professional judgment used to qualify soils.

3.0 Laboratory Method

Yes ☒ No ☐ N/A ☐ Comments:

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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3.2 Are ☒ the practical quantitation limits the same as those specified by the **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**
☒ QAPP/IRSWP ☐ Lab?

Note: The MADEP QA/QC Guidelines do not yet list PQLs for wet chemistry analyses, therefore all criteria will default to values stipulated in the QAPP*. Where the QAPP does not define criteria, QA/QC requirements default to limits employed by the lab**. Other criteria may also apply.

Ammonia* <input checked="" type="checkbox"/> = 0.1 mg/ L	Alkalinity** <input type="checkbox"/> = 1 mg/L	Bicarbonate Alkalinity** <input type="checkbox"/> = 1 mg/L	Carbonate Alkalinity** <input type="checkbox"/> = 1 mg/L
Nitrate Nitrogen as N* <input type="checkbox"/> = .05 mg/L	Nitrite Nitrogen as N* <input type="checkbox"/> = .01 mg/L	Chloride* <input checked="" type="checkbox"/> = 1 mg/L	Hardness * <input type="checkbox"/> = 2 mg/L
Spec. Cond.** <input checked="" type="checkbox"/> 3 umhos/cm	Total Organic Carbon** <input type="checkbox"/> = 1 mg/L	Oil & Grease* <input type="checkbox"/> = 5.5 mg/L	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 2 mg/L
COD:* Low - 20 mg/L	COD* High - 50 mg/L <input type="checkbox"/>	TDS* <input type="checkbox"/> = 10 mg/L	TSS* <input type="checkbox"/> = 5 mg/L
pH* <input type="checkbox"/> < 2 to > 12	Phenolic - 0.01 mg/L		
Other parameter(list) _____	PQL = _____	<input type="checkbox"/> Source of PQL = _____	
Other parameter(list) _____	PQL = _____	<input type="checkbox"/> Source of PQL = _____	

ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, moisture, etc. If sample PQL is indeterminate, contact lab for explanation.

3.3 Are the appropriate parameter results present for each sample in the SDG? **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

ACTION: If no, check Request for Analysis to verify if method was ordered and COC to verify that it was sent, and contact lab for resubmission of the missing data

3.4 If dilutions were required, were dilution factors reported? **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

ACTION: If no, contact the lab for submission.

4.0 **Method Blanks** **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

4.1 Are the Method Blank Summaries present?

ACTION: If no, call the laboratory for submission of missing data.

4.2 Was a method blank analyzed for each analysis batch of wet chemistry field samples of 20 or less? **Yes** ☒ **No** ☐ **N/A** ☐ **Comments:**

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ACTION: If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.

4.3 Is the method blank less than the PQL? (See Section 3.2 for PQLs).

Yes ☒ No ☐ N/A ☐ Comments:

4.4 Do any method blanks have positive results for wet chemistry parameters? Qualify data according to the following:

Yes ☐ No ☒ N/A ☐ Comments:

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

ACTION: If any blank has positive results, list all the concentrations detected and flagging level (flagging level = $5 \times$ blank value) on the checklist. List all affected samples and their qualifiers.

5.0 Laboratory Control Standards

5.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, call laboratory for LCS form submittal. If data is not available, use professional judgment to determine qualification actions for data associated with the batch.

5.2 Is a LCS Summary Form present?

Yes ☒ No ☐ N/A ☐ Comments:

ACTION: If no, contact lab for resubmission of missing data.

5.3 Is any wet chemistry analyte LCS recovery outside the control limits?

Yes ☐ No ☒ N/A ☐ Comments:

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LCS Limits:

Alkalinity** <input type="checkbox"/> = 80-120%	Bicarbonate Alkalinity** <input type="checkbox"/> = 80-120%	Carbonate Alkalinity** <input type="checkbox"/> = 80-120%	Specific Conductivity * <input checked="" type="checkbox"/> = 80-120%
Total Organic Carbon** <input type="checkbox"/> = 80-120%	TDS** <input type="checkbox"/> = 80-120%	Oil & Grease* <input type="checkbox"/> = 80-120%	Ammonia Nitrogen as N* <input checked="" type="checkbox"/> = 80-120%
COD Low* <input type="checkbox"/> = 80-120%	COD High* <input type="checkbox"/> = 80-120%	Nitrate Nitrogen as N** <input type="checkbox"/> = 80-120%	Nitrite Nitrogen as N** <input type="checkbox"/> = 80-120%
Hardness* <input type="checkbox"/> = 80-120%	Chloride* <input checked="" type="checkbox"/> = 80-120%	Sulfate (EPA 300.0)* <input checked="" type="checkbox"/> = 80-120%	pH* <input type="checkbox"/> = 98-102% TSS* NA

Other parameter(list) _____ %R = _____ ☐ Rec Limits= _____

Other parameter(list) _____ %R = _____ ☐ Rec Limits = _____

(MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

ACTION: If recovery is above the upper limit, qualify all positive sample results within the batch as (J). If recovery is below the lower limit, qualify all positive and no-detect results within the batch as (J). If LCS recovery is <10%, non-detect results are rejected (R).

6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs analyzed? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

Yes ☒ No ☐ N/A ☐ Comments: Chloride / Sulfate

6.2 Is the MS/MSD Recovery Form present?

ACTION: If no, contact lab for resubmission of missing data.

Yes ☒ No ☐ N/A ☐ Comments:

6.3 Were matrix spikes analyzed at the required frequency of 1 per 20 samples per matrix?

ACTION: If any matrix spike data is missing, call lab for resubmission.

Yes ☒ No ☐ N/A ☐ Comments:

6.4 Are any wet chemistry analyte spike recoveries outside of the QC limits?

Yes ☐ No ☒ N/A ☐ Comments:

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%R
SA

$$\%R = (SSR-SR) \times 100\%$$

SA = Spike added

SSR

$$SR = \frac{\text{Spiked sample result}}{\text{Sample result}}$$

MS/MSD Recovery Limits:

$$\text{Alkalinity}^* = \text{NA}$$
$$\text{Bicarbonate Alkalinity}^* = \text{NA}$$

Carbonate alkalinity* = NA

Ammonia* (LACHAT) □ = 75-125%

Chloride*(SM 4500 Cl) ☒ = 75-125%

Specific Conductivity * = NA

Total Organic Carbon* = NA

TDS** = NA

Oil & Grease* = NA

COD Low* □ = 75-125%

COD High* □ = 75-125%

Nitrate Nitrogen as N** □ = 75-125%

Nitrite Nitrogen as N** □ = 75-125%

Hardness* □ = 75-125%

Sulfate (EPA 300.0)* ☒ = 75-125% pH* = NA

$$\text{TSS}^* = \text{NA}$$
Other parameter(list) % R = Rec Limits =

* = Laboratory Limits

** = Olin QAPP Limits (MADEP has not yet defined LCS recovery limits for wet chemistry analyses.)

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. Do not evaluate if sample concentration is > 4X spike. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit but > 30%, qualify both positive results and non-detects (J). If the MS/MSD recovery is < 30% and the sample is non-detect, the results are considered unusable and flagged (R).

ACTION: Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data is evaluated, but no flags are applied.

6.5 Are any RPDs for MS/MSD recoveries outside of the QA/QC limits?

NOTE: $RPD = \frac{S - D}{(S + D)/2} \times 100\%$ Where S = MS result
D = MSD result

Yes [] No [☒] N/A [] Comments:

MS/MSD RPD Limits:
$$\text{RPD} \leq 20$$

7.0 Laboratory Duplicate

Are the RPDs for the laboratory duplicates <20% unless otherwise specified below?

Yes [☒] No [☐] N/A [☐] Comments:

Conductance only

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ACTION: If the RPD is greater than specified limits, qualify all results for that analyte as estimated (J).

pH* ☐ = 3%

Specific Conductivity *☒ = 5%

TSS** ☐ = 6%

TDS** ☐ = 6%

8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.

Yes ☐

No ☒

N/A ☐

Comments:

8.2 Do any rinsate blanks have positive results?

Yes ☐

No ☐

N/A ☒

Comments:

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.

If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is $> 5 \times$ blank value, no qualification is needed.

NOTE: MADEP does not require the collection of rinsate blanks.

9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes ☐

No ☒

N/A ☐

Comments:

9.2 Were field duplicates collected per the required frequency?

Yes ☐

No ☐

N/A ☒

Comments:

QAPP/IRSWP ☐ MADEP Option 1 (1 per 20) ☐ MADEP Option 3 (1 per 10) ☐

9.3 Was the RPD $\leq 30\%$ for waters $\leq 50\%$ for soils? Calculate the RPD for results and attach to this review.

Yes ☐

No ☐

N/A ☒

Comments:

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ACTION:.. Qualify data (J) for both sample results if the RPD exceeded.

Was any of the data qualified?

Yes ☐

No ☒

N/A ☐

Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and **flag pages** for entry in database.

REFERENCES:-

MACTEC, 2007. "Draft Interim Response Steps Work Plan"; Olin Chemical Superfund Site, 51 Eames Street, Wilmington, Massachusetts.; Project No. 6300-06-0010/41.1; July 25, 2007.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols," WSC-CAM #10-320, Final, Revision No. 1, 5 July 2010.

MADEP, 2010. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data in Support of Action Conducted Under the Massachusetts Contingency Plan (MCP)," WSC-CAM, Section VIIA, Final, Revision No. 1, 1 July 2010.